1896

DEPARTMENT OF THE INTERIOR

1-944

Handwriting matches that of Frank. Knowlton.

8/10/06

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June 17, 1896 -

Visited Golden today. Called first on The President of the State Mining School, Dr. , and by him was shown over the building and through the collections. They have a very fine working series of rocks and minerals for class work. They have a small collection of plants from Florissant not all labeled. They have a very fine cycad trunk, about 2 feet in height and 12 by 8 or 9 inches in diameter. It is said to have come from Boulder but the exact locality could not be ascertained. It was

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three or four times as long as
now when first discovered
but was broken before it
was known what it was. It
is felt presumed and looks
very much like the Black
Hills examples.

They have also a half dozen
or more palm-trunks from
fifteen feet to twenty diam-
eter. They came from the
vicinity of Golden. The School
has a small collection of
partially removed leaves &
ferns from the Brown beds
of Golden, but from nothing
new. They also have a
small collection from the Da-
kota of Morrison, all unlabeled.
They have one large palm
leaf with petiole that must
cover an area of four sq feet.
It is as good as the best we
have from Florissant.

Then we went up along the
base of Dobbs Mt. Followed
along the irrigating ditch &
is about 300 feet below the
lava cap. There are numerous
opossums & brown bear, but
none that we could find were
plant-bearing. On the side
opposite to Dobbs Mt. we
climbed up to the base of the

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dova cap and then found a
fairly good plant horizon.
The material broke up into
small irregular fragments,
but I managed to get half
a dozen determinable spines.
In the afternoon rode about
toward Green Mt. The strata
are standing on edge, and
fine exposed. Recognized readily
the Dunkard and Laramie but
could not find the Stropodus
Sandalus the Dakota and the
intermediate formations up to
the Jurassic. We observed
that clay had been mined
from between the upturned

layers of various horizons from
the Laramie apparently to the Jurassic.
The seams of clay run from 4 to
8 feet in width and in some cases
had been mined in for more
than a hundred feet. The walls
were shored with heavy timbers.
In another place we observed
that the white Laramie sandstone
was being quarried for building
purposes.

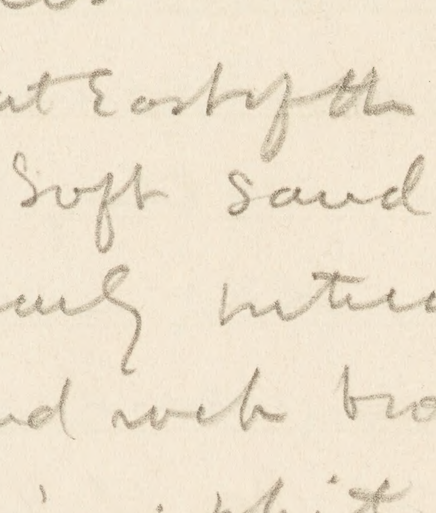
Sedalia Colo.

Lowlig 150 feet E ast of the Douglas coal mine. Soft sand rock standing nearly vertical, Color of sand rock brownish on oxydation; white when not oxydized. Work por some time shows the following forms:

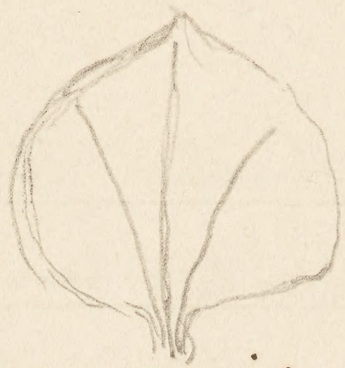
Dombeyopsis

Rhamnus Californica

Viburnum



Reinaudiomeria Affinis



Under guidance of Mr. John Lewis visited the localities described by Lakes as 1900 and 3000 feet East of the Douglas (now Lehigh) coal mine. As stated above the rock near the mine is nearly vertical. On following down the now abandoned rail road track for about 400 or 500 feet the beds become spread out to about 45° & a short distance further become horizontal.

The beds in these Mesa are made up of a coarse conglomerate with

K L M N O P Q R S T U V W X Y Z

clay bluffs in which the plants occur in great abundance dug out a few just to show that they are the same as obtained by Lakes

July 1. 1896. Wed.

Left Lusk. 7½ a.m. for Lance Creek

July 2. 96.

Reached Lance Creek at 11.30 in the midst of the Cenotopsis beds. Stanton went up the Creek about 5 miles this afternoon. Went to the Fox hills and coming back found a plant bed.

July 3. Went with Stanton to work the plant bed found yesterday. It is in a deep ravine about ½ miles S-W of the U-L ranche where we camp [illegible]. The beds are in one

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of the head of the first creek
or dry track coming into
Lower Creek below Camp.
The bed containing the bones
is about 2 feet thick and
a hard clay. It is about
6 feet below a heavy sand-
stone layer in which I found
found Taranis shells.
We worked all morning &
second portion of the afternoon
The following species were
collected:
Trapezium microphylum
Potalia sp.
Ferussacia small, distinct

Grasses tuval forms
Equisetum.
Salvinia sp?
Decrem "
Fern ramifolia?
Lichen, lungs.
Carpets sewed up.
Insect? wing of butterfly
The sandstone seems to
dip about 5° to the West.

In another locality
wood in found another simi-
lar plant bed containing
Tropa.

In the afternoon we went down to the Field Cot- Cliff & Stanton found a fine layer of freshwater tertiary shells & ground fine specimens. The bed is about 25 or 30 feet above the bed of the Creek. In the same bed he also found plants. Ob- tained Viburnum marginatum Impressa Fragaria &c.

July 4-

Sick - in camp all day - Stanton went up Lance Creek hunting Miocene beds. Collected few plants.

S T U V W X Y Z

July 5.
Worked the hill Cot ledge today
Secured a fine lot of shells &
plants. The plants are in clay &
also in soft Sandstone. Obtained
about 10 species. Viburnum margin-
atum? Mahonia Nervosa, Salix cordata?
Platanus Raynoldsii, Acer
macrophyllum (one leaflet) Menispermi-
tes?

July 6.
Started east from U-L ranch
house up head of first gulch
coming down into Lamb Creek
which is followed down. It
enters the creek just below the
hill Cot ledge. Saw one of
Hatcher's workings about a
mile above the creek. It was a
very large one and must have
afforded a large skull.
Just below the junction of this
gulch ~~Gulch~~ and the creek is a fine
bluff exposure, about 50 feet
in height. It is mainly clay,
sandy clay & one or two thick
layers of soft sandstone.

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The only remains found were
stems and roots and tubers of
Equisetum of which fair food
specimens were collected.
We then continued down
Lance Creek to within perhaps
two miles of the mouth of
Lightning Creek, where we struck
across the flat to the divide
between Lance & Lightning Creeks
and followed along the divide
to about opposite Camp when
we struck the trail we took and
came in.
We found no fossils of any
kind on Lance Creek, and from
appearances on the divide

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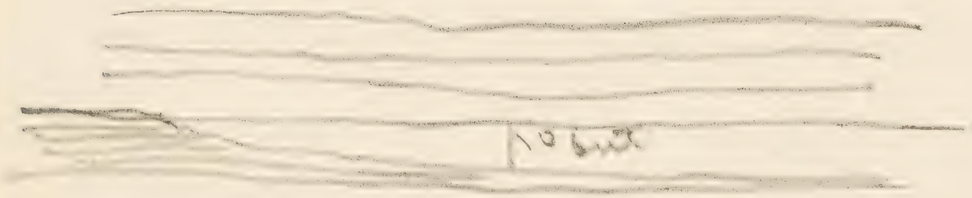

July 7

Followed the first gulch coming into Lance Creek from the west below U-L up to the divide. This is about 5 miles and shows the finest series of exposures yet found. The dips of the lower portion of this series is very slight being not about 5° to the west. The beds are made up of alternating Sandstones and clays, - the one passing into the other abruptly. In one bluff a band of sandstone ten feet in thickness was entirely replaced by stratified clay within 100 feet.

Near the top of the divide

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the beds pass into the lignitic
beds and layers mentioned
by Hatcher and for a mile
pronounced dip to the west
is estimated that beds formed
through not more than 500 feet
from Camp to the crest of the
divide.
In this rock along the divide
trail could be marked the
lignite beds in this vicinity. They
dip west about 12-15° and are
clays with prominent bands of
poor lignite. Traces of plant
are found but nothing
determinable.
We followed down a

yulch just This side of Little
Lightning Creek and came
down Lame Creek 45 Camps.
In investigated the under-
lying formations of Flint
Hoe Hills finding a good ma
Lame Creek just below L.
Lightning Creek. They dip
about 25°

July 8 -

. Moved camp. Started
out over into Lightning Creek
drainage and followed it
down to Lame Creek to our
new camp. Reported no
plants

July 9-96
Crossed the Creek & took up Camp and went West to the divide between the Creek here and the long bend in water to the N-E. On the divide we found a thin layer containing Union and a few fragmentary plants.
We retured the first speech on The divide and followed it down To Lamb Creek - some 5 miles. It comes out about 2½ or 3 miles below mouth of Lightning Creek.

The exposure is good all the
way down. At the head are
massive sandstones with
numerous thick beds of
impure lignite in some
cases 4-5 feet thick. No
plants observed.

About half way down
we collected some fine
preserved bones that are
probably common cow
bones. They are in a
bank 8 feet below the sur-
face in white soft clay
½ inches in diameter.
The bones are in a distinct
stratified layer of clay

Sand and small gravel.
There was a small band of
gravel pinkish and
a clear one above the
bones. If they are oxtrons
of ~~the~~ elephants to see how
they got there.

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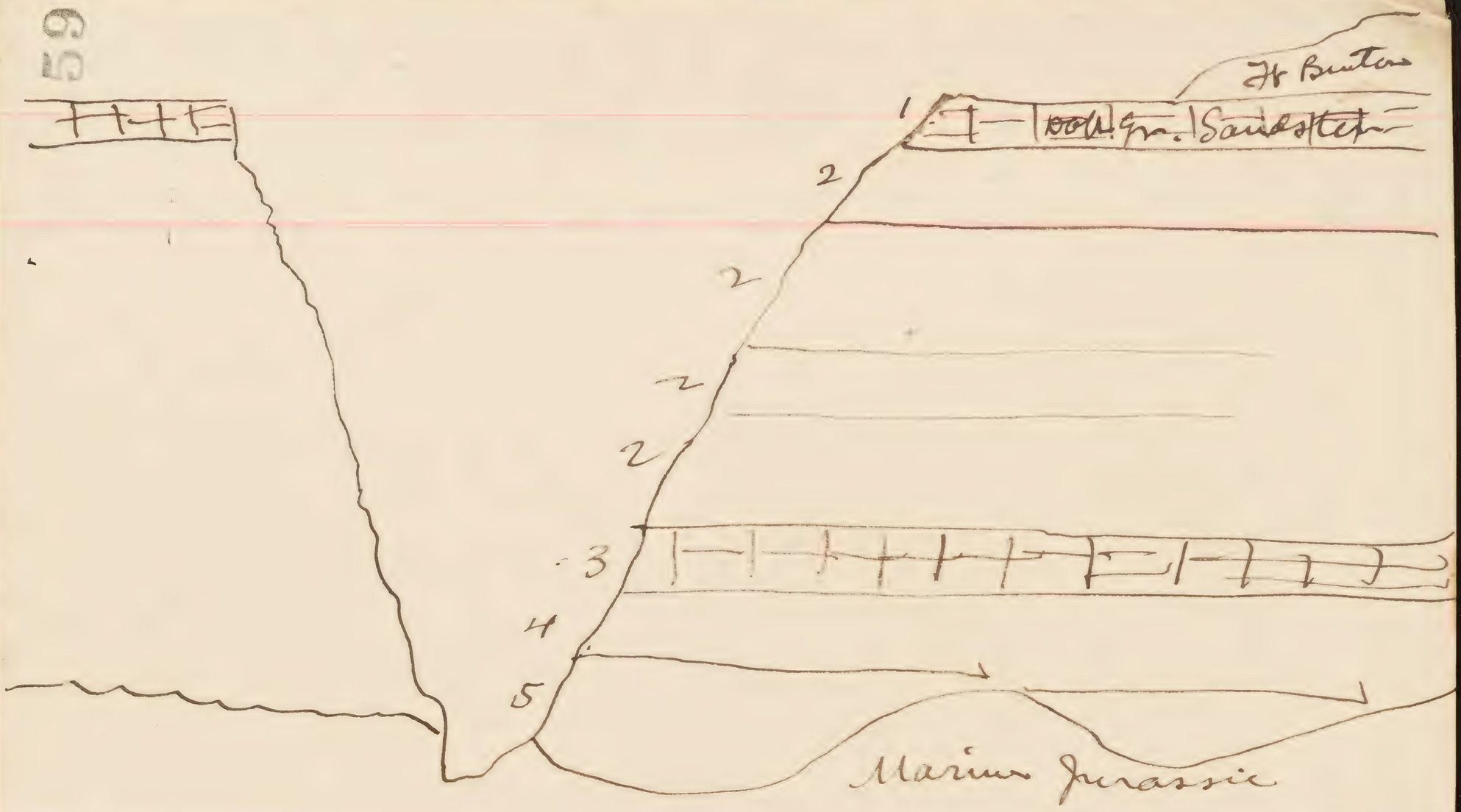

Ft Benton Shales

Dakota Group of Western.

1	Dakota Sandstones	50–100 feet
2	" " + Shales	50–200 "
3	" " + "	50–150 "
4	→ Shales with coal	50–100 "
5	Late Jurassic clays	30–55 "

Marine Jurassic.

Ideal Section of Dakota Group on Hay Creek, Mont. By W. P. Jenney.

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